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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/419,872	10/19/1999	AKIHISA KAWAGUCHI	1344.1033/JD	1976

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EXAMINER
SEDIGHIAN, REZA

ART UNIT	PAPER NUMBER
2633	7

DATE MAILED: 04/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/419,872	KAWAGUCHI ET AL.	
	Examiner	Art Unit	
	M. R. Sedighian	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 February 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-6 and 8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-6 and 8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

1. This communication is responsive to applicant's 2/3/2003 amendment in the application of Kawaguchi et al. for "Method of controlling optical wavelength division multiplexing transmission apparatus" filed 10/19/1999. The amendments have been entered. Claims 1, 3-6, and 8 are now pending.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugaya et al. (US patent No: 6,025,947).

Regarding claim 8, Sugaya discloses a method of controlling an optical wavelength division multiplexing transmission apparatus (col. 4, lines 45-55 and fig. 3) having an optical amplification section (1000, fig. 3), comprising: setting initial information including a number of wavelengths being used and wavelength being used (col. 7, lines 45-50, col. 8, lines 22-25, 51-58); setting an amount of optical attenuation corresponding to each of the wavelengths (71, 66, fig. 3); determining when a variation in the number of wavelengths being input occurs (51-54 and 70, fig. 3); and when a variation in the number of wavelengths being input occurs (col. 8, lines 51-58), controlling an amount of optical attenuation corresponding to the wavelength of the optical signal being input, so that the power level of the optical signal following the wavelength number variation is approximately constant (col. 8, lines 55-61, 67, col. 9, lines 1-3), and so that the optical power level per single wavelength of the multiplexed optical signal input into the

optical amplification section is of a level which corresponds to the number of wavelengths following the determined variation in the number of wavelengths (col. 9, lines 1-5, col. 17, lines 23-26). Sugaya differs from the claimed invention in that Sugaya does not disclose setting an amount of optical attenuation to a maximum value. Sugaya discloses a monitor signal processing circuit (70, fig. 3) that detects and extracts variation in number of channels (col. 7, lines 51-52) and that controls the operation of an optical attenuator (col. 7, lines 52-53 and 64, fig. 3). Therefore, it would have been obvious to an artisan at the time of invention that an optical monitor signal processing circuit such as the of Sugaya can control the amount of optical attenuation, for example by setting the amount of attenuation to a maximum value, in order to provide a predetermined optical energy and an output power level for the amplified multiplex optical signal.

4. Claims 1 and 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosaka (US patent No: 6,094,296) in view of Sugaya et al. (US patent No: 6,025,947).

Regarding claim 1, Kosaka discloses a method of controlling an optical wavelength division multiplexing transmission apparatus (col. 2, lines 55-60 and fig. 10) which is equipped with an optical attenuation section (8, figs. 4, 10) for attenuating (17b, 17c, fig. 4) individually the power level of each of a plurality of input optical signals ($\lambda 2$, $\lambda 3$, fig. 4) of different wavelengths (col. 5, lines 60-67, col. 6, lines 1-10, col. 7, lines 54-58), an optical multiplexing section (19, fig. 4), an optical amplification section (9, figs. 4, 10), and a spectral analysis section (34, fig. 10), wherein the method comprises the steps of setting initial information including the wavelength being used (col. 5, lines 11-14), the number of wavelength being used ($\lambda 1$, $\lambda 2$, $\lambda 3$,

fig. 4), setting the amount of optical attenuation corresponding to each wavelength (col. 7, lines 57-58 and 14, fig. 4, 10) and setting the operation of the optical amplification section to an automatic level control (col. 5, lines 45-47, 52-57). Kosaka differs from the claimed invention in that Kosaka does not specifically disclose setting of the amount of optical attenuation corresponding to each wavelength to a maximum value and controlling the power level of the optical signals of each wavelength analyzed by the spectral analysis section to approximately constant level. Kosaka discloses a controller 14 for controlling the gain of optical amplifier or attenuation performed by the optical power adjusting means (col. 3, lines 10-14 and 8, figs. 4, 10). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention that a controller such as the one of Kosoka can provide a maximum amount of attenuation for each wavelength in order to control the input powers to a predetermined value and to prevent wavelength deviation between adjacent channels. As to controlling the power level of the optical signals of each wavelength to approximately constant, Kosaka further discloses the control unit 14 that controls the excitation light source 11 in the optical amplifier unit 9 in response to power of light at the respective wavelengths or a deviation of power between the wavelengths that are detected by the output monitor such that the power of the light at the respective wavelengths or the deviation of power between the wavelengths reaches a predetermined value (col. 13, lines 15-25). Therefore, it would have been obvious to a person of ordinary skill in the art that a controller such as controller 14 can provide a constant power level for each wavelength to provide an output light of constant power level even if the input light fluctuates in its power level to avoid the occurrence of an error in the multiplexed data at a downstream location due to fluctuation of the optical signal power. Kosaka further differs from

the claimed invention in that Kosaka does not specifically disclose upon a variation of the number of input wavelengths, switching the operation of optical amplification section from automatic level control to automatic gain control, and controlling the amount of attenuation following the wavelength number variation to a constant level. Sugaya discloses an optical multiplex transmission system (figs. 1, 20, 22), wherein the multiplexed optical signals (col. 17, lines 43-45) are attenuated (64, fig. 20), amplified (521, fig. 20), and monitored (70, fig. 20). Sugaya discloses a monitoring step (70, figs. 20, 22) that monitors the variation of number of wavelengths (col. 7, lines 25-36, col. 17, lines 49-55) and a control circuit (66, figs. 20, 22) for controlling the amount of attenuation (col. 17, lines 56-59) by an optical attenuator (64, figs. 20, 22) and an automatic gain control circuit (60_1, figs. 20, 22) for controlling the gain of the optical amplifier (col. 21, lines 20-23 and 52_1, 59_1, figs. 20, 22) based on the result of the monitoring step (col. 17, lines 60-63 and 70, figs. 20, 22 and 98, fig. 22). Sugaya teaches upon variation in the number of input wavelengths (col. 17, lines 52-55), the operation of the optical amplification section can be switched from automatic level control to automatic gain control (col. 17, lines 55-56). Sugaya further teaches the amount of optical attenuation following the wavelength number variation can be controlled to a constant level (col. 17, lines 60-63). Sugaya further teaches a power level for the single wavelength of the multiplexed optical signal to be at a level corresponding to the number of wavelengths following variations (col. 9, lines 1-5, col. 17, lines 23-26). One of ordinary skill in the art would have been motivated to incorporate an optical amplifying apparatus which is capable of arbitrarily adjusting optical output power at respective wavelengths of a wavelength multiplexed signal light when the input power is uniformly increases or decreases to provide a constant gain and a constant power level. Therefore, it would

have been obvious to an artisan at the time of invention to incorporate a monitoring unit and control circuitries such as the ones of Sugaya for the monitor and control circuitries in the multiplex communication system of Kosaka in order to provide a monitoring step that can detect variation of number of channels and to control the amount of attenuation and gain of the optical amplifier based on the number of channels to further provide an optical amplifying apparatus with reduced non-linear degradation and S/N degradation and to control the power level of the individual signals approximately constant.

Regarding claim 3, As to switching the operation of the optical amplification section, upon reduction of number of input wavelengths, by setting the amount of optical attenuation to a maximum value, Sugaya discloses a monitor signal processing circuit 70 that detects and extracts variation in number of channels and that controls the operation of the optical attenuator 64 (col. 17, lines 53-58). Therefore, such monitor and control system can detect when a reduction in number of input channel occurs and it can further control the attenuator such that it provides a maximum amount of attenuation.

Regarding claim 4, Kosaka discloses a spectral anomaly processing step (34, fig. 10), which upon occurrence of an anomaly in the analysis operation of the spectral analysis section (col. 13, lines 8-15) controlling the amount of optical attenuation corresponding to each wavelength (col. 13, lines 15-25).

Regarding claim 5-6, Kosaka differs from the claimed invention in that Kosaka does not disclose when the operation of the optical amplification is switched to automatic gain control, generating a supervisory control signal. Sugaya further discloses a supervisory control processing step which inform the subsequent stage that the optical amplification is switched to

automatic gain control (col. 19, lines 30-36, col. 20, lines 15-20, 23-37). As to claim 6, Sugaya discloses a supervisory control channel of different wavelength (col. 19, lines 31-32). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate a monitoring and a supervisory control processing step such as the one of Sugaya for the monitor and processing stage in the multiplex communication system of Kosaka in order to provide supervisory information such as identification number for identifying the individual optical amplifiers or to provide and identify the channel number and the number of channels.

5. Applicant's arguments filed 2/3/03 have been fully considered but they are not persuasive.

Remark states Sugaya does not disclose a control for the level deviation between respective wavelengths in the output of the optical amplification section. Sugaya teaches the wavelength multiplexed optical signal has its level controlled to be within a predetermined range (col. 9, lines 1-5, col. 17, lines 10-14) and the power level of the wavelength multiplexed optical signal is being constant even when a signal input via a transmission optical fiber varies greatly (col. 17, lines 23-26). Remark further states Sugaya does not disclose control of optical attenuation section at the time of variation in the number of wavelengths. Sugaya discloses when the change in the number of channels is completed monitor signal processing circuit 70 allows optical attenuator 64 to resume its control for maintaining the optical output power at a constant level (col. 17, lines 60-63). Note that claim 1 recites "... controlling the amount of optical attenuation corresponding to the wavelength of the optical signal being input into said optical

attenuation section so that the power level of the optical signal of each wavelength analyzed by said spectral analysis section following the wavelength number variation is approximately constant, ...". According to claim 1, the amount of optical attenuation is controlled to be constant following the wavelength number variation. Sugaya also teaches when the change in number of channels is completed, monitor signal processing circuit 70 allows optical attenuator 64 to resume its control for maintaining the optical output power at a constant level (col. 17, lines 60-63). Applicant's attention is directed that during the prosecution of a pending patent application the terms found in the claims should be given the broadest reasonable interpretation, *See in re Pearson,* 181 USPQ 641 (CCPA 1974).

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. R. Sedighian whose telephone number is (703) 308-9063. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703) 305-4729. The fax phone numbers for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

JASON CHAN
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